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APPARATUS AND METHOD FOR STACKING GREEN SHEETS, AND METHOD
FOR PRODUCING LAMINATED CERAMIC ELECTRONIC COMPONENTS

Detailed Description of the Invention

Technical Field of the Invention

The present invention relates to a green-sheet stacking apparatus suitably used for producing laminated ceramic electronic components such as laminated capacitors, to a method for stacking green sheets, and to a method for producing laminated ceramic electronic components.

Description of the Related Art

A variety of methods for producing ceramic electronic components, such as laminated capacitors, using thinner green ceramic sheets have been proposed.

For example, a production method using a cutting and stacking head 51 shown in Fig. 10 is disclosed in Japanese Unexamined Patent Application No. 05-6844. A green ceramic sheet 53 is carried on a carrier film 52.

While the green ceramic sheet 53 carried by the carrier film 52 lies on a stage 54, the cutting and stacking head 51 moves up and down as shown by the arrow in the drawing. The cutting and stacking head 51 has a main body 55 and a blade

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56 disposed around the main body 55. The main body 55 has a bottom 55a serving as a stacking surface.

The blade 56 is formed in a rectangular tube-like shape. The cutting and stacking head 51 moves down to the green ceramic sheet 53 and then the blade 56 cuts the green ceramic sheet 53 into a rectangular flat sheet. When the cutting and stacking head 51 moves downward, the newly cut-out green ceramic sheet is press-attached onto the bottom 55a of the main body 55 or onto a stacked green ceramic sheet 53a. Pulling the cutting and stacking head 51 upward after press-attaching allows the cut-out green ceramic sheet 53a to be separated from the carrier film 52 and to be stacked on the bottom 55a of the main body 55. By repeating this process, a plurality of the green ceramic sheets 53a is stacked on the bottom 55a of the main body 55, thus forming a laminate 57.

Then, the laminate 57 is placed on an additionally prepared stacking stage and then is pressed in the depth direction thereof. By firing this laminate, a sintered ceramic compact for being incorporated into a laminated capacitor and the like is made.

In the production method stated in Japanese Unexamined

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Patent Application No. 05-6844, the cutting and stacking head 51 is used to cut and stack a green ceramic sheet. Accordingly, this eliminates independent handling of the green ceramic sheet 53 for separating the green ceramic sheet 53 from the carrier film 52 prior to cutting the green ceramic sheet 53, thereby allowing the thin green ceramic sheet 53 to be used for making a laminate.

At the same time, the sintered ceramic compacts produced according to the method stated in the foregoing related art have a problem in which the sintered ceramic compacts are likely to delaminate at the side faces or the end faces thereof after sintering.

More specifically, the plurality of green ceramic sheets 53a is stacked on the bottom 55a of the main body 55 of the cutting and stacking head 51. When the blade 56 cuts one of the green ceramic sheets 53a, the blade 56 moves up and down independent of the main body 55.

Accordingly, an inner surface 56a of the blade 56 slides on the side faces, i.e., the cut-faces, of the cut-out green ceramic sheets 53a, thereby increasing the risk of producing green ceramic sheet chips or to lower the adhesiveness between adjacent stacked green sheets 53a,

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resulting in partial delamination. In addition, load due to contacts between the cut surfaces of the green ceramic sheets 53a and the inner surface 56a of the blade 56 may make the cutting operation of the following green ceramic sheet 53 unstable.

Accordingly, an object of the present invention is to provide an apparatus and a method for stacking green sheets, which solve the foregoing problems in the known art and are capable of stacking a plurality of green ceramic sheets stably and continuously without causing delamination between adjacent green ceramic sheets of a laminate.

Another object of the present invention is to provide a method, including a step of stacking green ceramic sheets using the green-sheet stacking apparatus according to the present invention, for producing reliable sintered ceramic compacts having little possibility of delamination and laminated ceramic electronic components incorporating the sintered ceramic compacts.

According to a broad aspect of the present invention, a green-sheet stacking apparatus for stacking green ceramic sheets carried by a carrier film is provided. The green-sheet stacking apparatus comprises a conveyer for conveying

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a green ceramic sheet; a cutter comprising a blade for cutting the green ceramic sheet conveyed by the conveyer into a flat, predetermined shape; and a stacker comprising a stacking surface for detaching the green ceramic sheet having the flat, predetermined shape cut by the cutter from the carrier film and stacking the detached sheet.

With respect to a specific aspect of the green-sheet stacking apparatus for stacking green ceramic sheets according to the present invention, the stacker further comprises a suction hole open to the stacking surface and sucking means connected to the suction hole, thus allowing the green ceramic sheets to be held securely by suction of the sucking means on the stacking surface in a closely contacting manner.

With respect to a specific aspect of the green-sheet stacking apparatus for stacking green ceramic sheets according to the present invention, the green ceramic sheet is a long green ceramic sheet, the conveyance direction of the green ceramic sheet is the longitudinal direction thereof, and the cutter and the stacker are juxtaposed in a direction orthogonal to the longitudinal direction, and moreover, the green-sheet stacking apparatus further comprises a shifter for shifting the cutter and the stacker

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so as to provide a first state in which the cutter lies above the green ceramic sheet in order to cut the green ceramic sheet and a second state in which the stacker lies above the green ceramic sheet in order to press-attach and stack the cut-out green ceramic sheet. In this case, the green ceramic sheet is cut by the cutter in the first state, and the cutter and the stacker are shifted to the second state by driving the shifter. In the second state, the cut-out green ceramic sheet is press-attached and stacked by the stacker.

With respect to another specific aspect of the green-sheet stacking apparatus for stacking green ceramic sheets according to the present invention, the green ceramic sheet has a certain length, and the green-sheet stacking apparatus further comprises a conveyer unit on which the green ceramic sheet carried by the carrier film is placed. In addition, the conveyer unit is configured to be conveyed by the conveyer between a feeding position for feeding the green ceramic sheet to the conveyer unit and a working position for cutting and stacking the green ceramic sheet, and the green-sheet stacking apparatus further comprises a shifter for shifting the cutter and the stacker so as to provide a first state in which the cutter lies above the working position and a second state in which the stacker lies above

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the working position for cutting and stacking the green ceramic sheet. In this case, the green ceramic sheet having a certain length is shifted by the foregoing conveying mechanism from the feeding position to the working position. While lying in the working position, the green ceramic sheet is cut by the cutter in the first state. Then, the cutter and the stacker are shifted to the second state by driving the shifter, and the cut-out green ceramic sheet is stacked by the stacker in the second state.

A method for stacking green sheets according to the present invention comprises the steps of preparing a green ceramic sheet carried by a carrier film; forming an electrode on the green ceramic sheet; cutting the green ceramic sheet having the electrode formed thereon into a flat, predetermined shape by a cutter; and stacking the green ceramic sheet on the stacking surface by press-attaching a stacking surface of a stacker or the stacked green ceramic sheet onto the cut-out green ceramic sheet and by detaching the cut-out green ceramic sheet from the carrier film, wherein the steps of cutting and the stacking are alternately repeated to form a laminate on the stacking surface.

A method for producing laminated ceramic electronic

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components according to the present invention comprises the steps of making a sintered ceramic compact by cutting and firing the laminate obtained by the method for stacking green sheets according to the present invention; and forming a plurality of external electrodes on outer surfaces of the sintered ceramic compact.

Description of the Embodiments

The present invention will now be described with embodiments according to the present invention.

Fig. 1 is a schematic elevational view in section illustrating a method for stacking green sheets using a green-sheet stacking apparatus according to a first embodiment of the present invention.

A schematically illustrated roll 1 rolls up a green ceramic sheet 3 therearound which is carried by a carrier film 2 composed of a synthetic resin film such as a polyethylene terephthalate film. The green ceramic sheet 3 is composed of material mainly from dielectric ceramics for making a laminated ceramic capacitor.

A roll 4 is disposed apart from the roll 1. The remainder of the green ceramic sheet 3 mounted on the carrier film 2 is long and is rolled up about the roll 4,

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the remainder being produced after a rectangular green ceramic sheet is cut and removed from the green ceramic sheet 3 as will be described later. Driving at least one of the rolls 1 and 4 allows the green ceramic sheet 3 to be conveyed in the longitudinal direction thereof.

In the embodiment, the roll 4 has a motor 5 as a driving source connected thereto as schematically shown in Fig. 1, and the motor 5 constitutes a conveyor. A cutting stage 6 and a stacking stage 7 are disposed between the rolls 1 and 4. The cutting stage 6 and the stacking stage 7, respectively, have flat surfaces 6a and 7a thereon. The cutting stage 6 and the stacking stage 7 may be configured integrally.

In the embodiment, the cutting stage 6 lies upstream and the stacking stage 7 lies downstream with respect to the conveying direction of the green ceramic sheet 3. A cutter 8 is arranged above the cutting stage upstream and a stacker 9 is arranged above the stacking stage 7 downstream.

The cutter 8 comprises a main body 10 and a blade 11 configured to be vertically movable independent of the main body 10. The main body 10 is configured to be vertically movable by a reciprocal-driving source such as an air

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cylinder (not shown). The blade 11 is connected to the main body 10 via urging means such as a spring (not shown) and is configured to be vertically movable independent of the main body 10. A cutting edge 11a of the blade 11 protrudes downward from a bottom 10a of the main body 10. The profile of the cutting edge 11a is a flat rectangular shape.

The blade 11 is designed so as to cut the conveyed green ceramic sheet 3 in a rectangular shape and not to cut the carrier film 2. However, the cutting edge 11a may cut the carrier film 2 from the top to half of the depth thereof.

While the main body 10 and the blade 11 described above are composed of appropriate metal such as stainless steel, material for forming the main body 10 and the blade 11 is not limited.

The stacker 9 arranged downstream has a block-like shape made from rigid material including metal such as stainless steel, though not limited to this. The bottom of the stacker 9 serves as a stacking surface 9a having a plurality of suction holes 12 formed therethrough. The suction holes 12 vertically extend through the stacker 9 and connect to a suction source such as a vacuum pump (not

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shown) at the top ends thereof.

The stacker 9 is configured to be vertically movable by a reciprocal-driving source such as an air cylinder (not shown). A method for producing laminated ceramic electronic components using the green-sheet stacking apparatus according to the embodiment will be described with additional reference to Figs. 2 to 4.

Rotating the motor 5 allows the green ceramic sheet 3, carried by the carrier film 2, to be pulled out of the roll 1 and to be conveyed toward the roll 4. While suspending this conveyance, cutting of the green ceramic sheet 3 is performed by moving down the cutter 8 and by punching out the green ceramic sheet 3 in a rectangular shape with the cutting edge 11a of the blade 11. The cutter 8 moves immediately after the cutting is performed. That is to say, the green ceramic sheet 3 is cut into a flat rectangular shape while it lies above the cutting stage 6; however, this cutting is performed such that the carrier film 2 is not cut.

Then, the cut-out green ceramic sheet is conveyed above the stacking stage 7. Whether or not the conveyance of the green ceramic sheets 3 is suspended above the stacking stage

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7, the stacker 9 moves down so that the green ceramic sheet 3 is press-attached onto the stacking surface 9a. In this case, the stacker 9 and a cut-out portion of the green ceramic sheet 3, i.e., a green ceramic sheet 3a having a cut-out flat rectangular shape, are positioned so that the green ceramic sheet 3a comes in contact with the stacking surface 9a of the stacker 9 so as to be stacked thereon.

By moving the stacker 9 down, press-attaching the cut-out green ceramic sheet 3a on the stacking surface 9a, and sucking through the suction holes 12, the green ceramic sheet 3 can be held to the stacking surface 9a. Then, moving the stacker 9 upward allows the green ceramic sheet 3a to be stacked on the stacking surface 9a.

By repeating this operation, a plurality of the green ceramic sheets 3a is stacked on the stacking surface 9a as shown in the drawing, resulting in the formation of a laminate 15.

Some of the plurality of green ceramic sheets 3a have internal electrodes printed thereon for making a stacked ceramic capacitor though this is not shown in Fig. 1.

Fig. 2 is an exploded schematic perspective view illustrating rectangular green ceramic sheets to be stacked

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according to the present embodiment.

According to the present embodiment, of a large number of rectangular green ceramic sheets, a plurality of the green ceramic sheets 3a centrally disposed in the depth direction thereof has a large number of internal electrodes 13 and 14 printed thereon for making a large number of stacked ceramic capacitors. Printing of the internal electrodes 13 and 14 is performed by a suitable method such as a screen-printing using a conductive paste. The plurality of green ceramic sheets 3a having the internal electrodes is stacked such that ones having the internal electrodes 13 and the others having the internal electrodes 14 are alternately disposed in the depth direction thereof, and in addition, plain green ceramic sheets 3a are stacked so as to sandwich the green ceramic sheets 3a having internal electrodes.

That is to say, the internal electrodes 13 and 14 are printed on the long green ceramic sheet 3 in the state shown in Fig. 1 so as to provide the laminate 15 having a lamination structure shown in Fig. 2.

After being detached from the stacking surface 9a of the stacker 9 in the absence of suction through the suction holes 12, the laminate 15 is pressed again in the depth

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direction thereof. Then, the laminate 15 is cut into pieces, and each piece of the laminate is fired so as to provide a sintered ceramic compact 16 as shown in Fig. 3. Subsequently, as shown in Fig. 4, the sintered ceramic compact 16 has external electrodes 17 and 18 formed on end faces 16a and 16b thereof so as to provide a laminated capacitor 19 as a laminated ceramic component.

The present invention is applicable for producing not only laminated capacitors but also other laminated ceramic electronic components such as ceramic multi-layer substrates.

According to the green-sheet stacking apparatus of the present embodiment, first of all the green ceramic sheet 3 is cut by the cutter 8, and then the cut-out green ceramic sheets 3a are stacked by the stacker 9 disposed downstream. Accordingly, the plurality of cut-out green ceramic sheets 3a stacked on the stacking surface 9a does not come into contact with the cutting edge 11 at the cut-faces thereof, thus providing the laminate 15 having excellent adhesiveness between adjacent green ceramic sheets 3a. Furthermore, the fact that the cut-out green ceramic sheet 3a does not come into contact with the blade 11 makes it unlikely that a green sheet chip produced by cutting accretes to the cut-out green ceramic sheet 3a.

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Consequently, occurrence of delamination in the sintered compact 16 made from the laminate 15 is surely suppressed, and thus the reliable laminated capacitor 19 is obtained.

In the green-sheet stacking apparatus shown in Fig. 1, the green ceramic sheet 3 is conveyed along the longitudinal direction of the long green ceramic sheet 3, and the cutter 8 and the stacker 9 are disposed upstream and downstream, respectively. However, the green-sheet stacking apparatus according to the present invention can be modified in various ways.

Fig. 5 is a schematic sectional view illustrating a first modification of the green-sheet stacking apparatus according to the foregoing embodiment. In a green-sheet stacking apparatus 21 shown in Fig. 5, the long green ceramic sheet 3 is conveyed between a pair of rolls while being carried by the carrier film 2 in the same manner as in the foregoing embodiment. In Fig. 5, the longitudinal direction of the green ceramic sheet 3 is orthogonal to the drawing. Fig. 5 is a sectional view illustrating a state in which the green ceramic sheet 3 and the carrier film 2 lie above a cutting and stacking stage 22.

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The cutter 8 and the stacker 9 are disposed above the green ceramic sheet 3. The cutter 8 and the stacker 9 are configured in the same fashion as in the first embodiment. The only differences are that the cutter 8 and the stacker 9 are arranged in a direction orthogonal to the conveyance direction of the green ceramic sheet 3, and additionally are configured so as to be moved by a shifter 23 in the direction of arrow A indicated in the drawing, that is, in a direction orthogonal to the conveyance direction of the green ceramic sheet 3. The shifter 23 is capable of moving the cutter 8 and the stacker 9 in the direction of arrow A indicated in the drawing so that the shifter 23 provides the state shown in Fig. 5, i.e., a first state in which the cutter 8 lies above the green ceramic sheet 3 so as to cut the green ceramic sheet 3, and a second state in which the stacker 9 lies above the green ceramic sheet 3 so as to stack the cut-out green ceramic sheet. A driving source of the shifter 23 may be of an appropriate reciprocal one though not limited to this.

In the green-sheet stacking apparatus 21 according to the embodiment, the conveyance of the green ceramic sheet 3 is suspended upon reaching above the cutting and stacking stage 22 shown in the drawing, the cutter 8 cuts the green

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ceramic sheet 3, and then the shifter 23 is moved from the first state to the second state so that the stacker 9 lies above the cut-out green ceramic sheet. Furthermore, the stacker 9 stacks the cut-out green ceramic sheet 3a in the second state. As described above, the cutter 8 and the stacker 9 may be arranged in a direction orthogonal to the conveyance direction of the green ceramic sheet 3.

Fig. 6 is a plan view schematically illustrating the green-sheet stacking apparatus shown in Fig. 5. The cutter 8 and the stacker 9 are arranged in a direction orthogonal to the conveyance direction of the green ceramic sheet 3 and are moved by the shifter 23 so as to lie in the first state and the second state as indicated by arrow A.

Although the long green ceramic sheet 3 rolled up around a roll is used in the foregoing embodiment and in the foregoing first modification, a green ceramic sheet having a certain length, e.g., a rectangular green ceramic sheet may be used in the green-sheet stacking apparatus according to the present invention.

In a second modification shown in Fig. 7, a rectangular green ceramic sheet 31 is carried on a rectangular carrier film 32 formed of a synthetic resin film. In this case, the

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rectangular green ceramic sheet 31 is fed to the green-sheet stacking apparatus provided with the cutter 8 and the stacker 9. The cutter 8 and the stacker 9 are configured in the totally same manner with the cutter 8 and the stacker 9 of the foregoing embodiment as shown in Fig. 8.

In the second modification, the rectangular green ceramic sheet 31 is placed on a conveyance unit 33 while being carried on the rectangular carrier film 32. The conveyance unit 33 has a flat top surface 33a. Accordingly, moving the conveyance unit 33 and positioning it below the cutter 8 allows the cutter 8 to cut the green ceramic sheet 31. Then, moving the conveyance unit 33 below the stacker 9 allows the stacker 9 to stack a cut-out green ceramic sheet 31a.

Thus, by moving the conveyance unit 33 below either of the cutter 8 and the stacker 9 alternately, the green ceramic sheet is cut and stacked in the same fashion as in the foregoing embodiment. In the second modification shown in Figs. 7 and 8, the cutter 8 and the stacker 9 are arranged upstream and downstream with respect to the conveyance direction of the conveyance unit 33, respectively.

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Fig. 9 is a schematic plan view illustrating another modification of the green-sheet stacking apparatus shown in Figs. 7 and 8. In a green-sheet stacking apparatus 41 shown in Fig. 9, the conveyance unit 33 is configured to be movable in the directions of arrows X and - X indicated in the drawing. The rectangular green ceramic sheet 31 is placed on the conveyance unit 33 while being carried on the rectangular synthetic resin film. The conveyance unit 33 is configured to be movable in the directions of arrows X and - X between a feeding position shown in Fig. 9 and a working position located below the cutter 8.

The cutter 8 and the stacker 9 are joined together by the shifter 23 in the same fashion as in the modification shown in Fig. 5 so as to provide a first state shown in Fig. 9 and a second state in which the stacker 9 lies above the working position. While the directions of arrows X and - X and the conveyance direction of the cutter 8 and the stacker 9 are orthogonal to each other, they are not limited to an orthogonal relationship. That is to say, the green ceramic sheet 31 is cut by the cutter 8 while it lies in the working position. Then, the shifter 23 is moved to the second state so that the stacker 9 lies above the cut-out green ceramic sheet. In this state, the stacker 9 stacks the green ceramic sheet.

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It will be appreciated from the foregoing modifications that an arrangement of the cutter and the stacker of the present invention, and a conveyance direction and a feeding method of a long green ceramic sheet or a green ceramic sheet having a certain length according to the present invention are not limited.

When the green-sheet stacking apparatus according to the present invention is used, a method for stacking green sheets is in accordance with the method for stacking green sheets according to the present invention. That is to say, the cutter and the stacker are configured independent of each other so that a conveyed green ceramic sheet is cut by the cutter into a flat, predetermined shape and the cut-out green ceramic sheet is stacked on the stacking surface of the stacker.

According to the known method for stacking green sheets wherein cutting and stacking is performed by a single head, cut-faces of stacked green ceramic sheets are in contact with the inner surface of the blade. This causes the cut-faces to be rubbed in every cut, thereby making it likely that delamination occurs in a sintered ceramic compact or a defective cut due to a green sheet chip occurs. On the

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other hand, the green-sheet stacking apparatus and the method for stacking green sheets according to the present invention surely suppresses the delamination and also performs cutting and stacking stably and continuously.

Thus, the method, including the method for stacking green sheets according to the present invention, for producing laminated ceramic electronic components according to the present invention provides reliable laminated ceramic electronic components in which delamination is unlikely to occur.

Brief Description of the Drawings

Fig. 1 is a schematic elevational view in section illustrating an apparatus and a method for stacking green sheets according to an embodiment of the present invention.

Fig. 2 is an exploded perspective view illustrating green ceramic sheets to be stacked according to the embodiment of the present invention.

Fig. 3 is an elevational view in section illustrating a sintered compact according to the embodiment of the present invention.

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Fig. 4 is an elevational view in section illustrating a stacked ceramic capacitor according to the embodiment of the present invention.

Fig. 5 is an elevational view in section illustrating a first modification of the green-sheet stacking apparatus according to the embodiment of the present invention.

Fig. 6 is a schematic plan view illustrating the modified green-sheet stacking apparatus shown in Fig. 5.

Fig. 7 is a schematic plan view illustrating a second modification of the green-sheet stacking apparatus according to the embodiment of the present invention.

Fig. 8 is an elevational view in section illustrating the modified green-sheet stacking apparatus shown in Fig. 7.

Fig. 9 is a schematic plan view illustrating a third modification of the green-sheet stacking apparatus according to the embodiment of the present invention.

Fig. 10 is an elevational view in section illustrating a known green-sheet stacking apparatus.

[Reference Numerals]

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- 1: roll
- 2: carrier film
- 3: green ceramic sheet
- 3a: green ceramic sheet
- 4: roll
- 6: cutting stage
- 7: stacking stage
- 8: cutter
- 9: stacker
- 9a: stacking surface
- 10: main body
- 11: blade
- 12: suction hole
- 13, 14: internal electrodes
- 15: laminate
- 16: sintered ceramic compact
- 17, 18: external electrodes
- 19: stacked ceramic capacitor
- 21: green-sheet stacking apparatus
- 23: shifter
- 31: green ceramic sheet
- 31a: green ceramic sheet
- 32: carrier film
- 33: conveyer unit
- 41: green-sheet stacking apparatus

Claims:-

1. A green-sheet stacking apparatus for stacking green ceramic sheets carried by a carrier film, comprising:
 - a conveyer for conveying a green ceramic sheet;
 - a cutter comprising a blade for cutting the green ceramic sheet conveyed by the conveyer into a flat, predetermined shape; and
 - a stacker comprising a stacking surface for detaching the green ceramic sheet having the flat, predetermined shape cut by the cutter from the carrier film and stacking the detached sheet, whereinthe cutter and the stacker are separate from each other.
2. The green-sheet stacking apparatus according to Claim 1, wherein the stacker further comprises a suction hole open in the stacking surface and sucking means connected to the suction hole.
3. The green-sheet stacking apparatus according to Claim 1 or 2, wherein the green ceramic sheet is a long green ceramic sheet, the conveyance direction of the green ceramic sheet is the longitudinal direction thereof, and the cutter and the stacker are juxtaposed in a direction orthogonal to the longitudinal direction,
 - the green-sheet stacking apparatus further comprising a shifter for shifting the cutter and the stacker so as to provide a first state in which the cutter lies above the

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green ceramic sheet in order to cut the green ceramic sheet and a second state in which the stacker lies above the green ceramic sheet in order to press-attach and to stack the cut-out green ceramic sheet.

4. The green-sheet stacking apparatus according to Claim 1 or 2,

wherein the green ceramic sheet has a certain length,

the green-sheet stacking apparatus further comprising a conveyer unit on which the green ceramic sheet carried by the carrier film is placed,

wherein the conveyer unit is configured to be conveyed by the conveyer between a feeding position for feeding the green ceramic sheet to the conveyer unit and a working position for cutting and stacking the green ceramic sheet,

the green-sheet stacking apparatus further comprising a shifter for shifting the cutter and the stacker so as to provide a first state in which the cutter lies above the working position and a second state in which the stacker lies above the working position for cutting and stacking the green ceramic sheet.

5. A method for stacking green sheets, comprising the steps of:

preparing a green ceramic sheet carried by a carrier film;

forming an electrode on the green ceramic sheet;

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cutting the green ceramic sheet having the electrode formed thereon into a flat, predetermined shape by a cutter; and

after cutting the green sheet, stacking the green ceramic sheet on the stacking surface by press-attaching a stacking surface of a stacker or the stacked green ceramic sheet onto the cut-out green ceramic sheet and by detaching the cut-out green ceramic sheet from the carrier film,

wherein the cutting step and the stacking step are alternately repeated to form a laminate on the stacking surface.

6. A method for producing laminated ceramic electronic components, comprising the steps of:

making a sintered ceramic compact by cutting and firing the laminate obtained by the method for stacking green sheets according to Claim 5; and

forming a plurality of external electrodes on outer surfaces of the sintered ceramic compact.

7. A method for producing laminated ceramic electronic components, according to claims 5 and 6, comprising further steps of:

the green ceramic sheet, which is cut by the cutter, is conveyed to the stacker as the carrier sheet upholding the green sheet.